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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/773,962 | 02/01/2001 | Brian Edward Causton | 08935-238001 / M-4952 | 6298 |

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| EXAMINER |
|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 1745 | 6 |

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 09/773,962 | CAUSTON ET AL. |
| | Examiner | Art Unit |
| | Tracy Dove | 1745 |

#6

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period f r Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 February 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-67* is/are pending in the application.

4a) Of the above claim(s) *41-50,55-61 and 63-67* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-40,51-54 and 62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-40, 51-54 and 62, drawn to a battery having a housing with openings that are not louvers, classified in class 429, subclass 163.

II. Claims 41-50, drawn to a metal-air battery capable of generating a specific pulse voltage (GMS), classified in class 429, subclass 27.

III. Claims 55-61 and 63-67, drawn to a battery casing having a slide that is alignable with an opening in the battery, classified in class 429, subclass 34.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as the battery may be used for portable electrically powered devices that do not require a specific GSM. Telecommunication applications usually require high voltages and currents from their electrical energy source. Zinc batteries may be used in pagers and motor vehicles. See MPEP § 806.05(d).

Inventions I and III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as

claimed because a casing for the battery housing containing a slide is not required by the subcombination. The subcombination has separate utility such as the battery can be used without a casing around the battery housing.

Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as the battery may be used for portable electrically powered devices that do not require a specific GSM. Telecommunication applications usually require high voltages and currents from their electrical energy source. Zinc batteries may be used in pagers and motor vehicles. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II or Group III, restriction for examination purposes as indicated is proper.

During a telephone conversation with Tu Nguyen on 1/24/03 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-40, 51-54 and 62. Affirmation of this election must be made by applicant in replying to this Office action. Claims 41-50, 55-61 and 63-67 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 6/4/01 has been partially considered by the examiner. Copies of the cited documents were not filed with the IDS, thus, only those documents which are U.S. patents have been considered.

***Specification***

The disclosure is objected to because of the following informalities: on page 15, line 23 the specification refers to a provisional application, but does not provide the serial number.

Appropriate correction is required.

***Claims Analysis***

Note page 6, lines 24-29 of the specification states that louver is defined in commonly assigned U.S.S.N. 09/374,277 (now U.S. 6,232,007). Thus, a "louver" means an opening or openings having a leaf or tab through which air can flow. When the louver is open on one side, the leaf is slanted. When the louver is open on both sides, the tab is substantially parallel to the outer surface of the container. See col. 2, lines 1-10 of U.S. 6,232,007.

Note "non-circular" in claim 1 is interpreted as meaning that the flux of gas though the openings, as a whole, do not form a single circular flux of gas. Specifically, any battery having a housing with more than one opening would provide a "non-circular" flux of gas. This

interpretation is being made in light of claim 5 which requires multiple openings having a circular shape while providing a "non-circular" flux of gas through the openings in the housing of the battery.

***Claim Objections***

Claim 62 is objected to because of the following informalities: it appears claim 62 should depend from claim 55. Claim 1 does not recite "A cartridge" and claim 11 already recites wherein the battery of claim 1 is a metal-air battery. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 2, 4-7, 9-11, 14, 19, 21-25, 27-29, 30-35, 40, 51-54 and 62 are rejected under 35 U.S.C. 102(e) as being anticipated by Adey et al., US 6,284,400 B1.

Adey teaches a metal-air cell having one or more air entry ports located in the bottom of the cathode can to provide for entry of oxygen-rich air into the cathode can. The air ports are distributed over the bottom of the cathode can, opposite the reaction surface of the cathode assembly. See abstract. Figure 1 shows a zinc-air cell (button cell) having a housing containing an anode can 12 electrically insulated from a cathode can 14 by a seal 16. Barrier layer 19 (separator) spaces the reactive anode material 31 from the cathode assembly 18 (see col. 6, lines 31-48). As oxygen enters the port, the oxygen spreads out over substantially the entire reaction surface 54 (of the cathode assembly), supplying necessary cathodic oxygen to the reaction surface. Figure 4 shows the spreading of oxygen over the reaction surface, which was known prior to the invention by Adey. This figure shows a circular flux of gas facilitated by the opening shown in prior art Figure 4. Figure 5 depicts the spreading of oxygen over the reaction surface by the inventive air ports of Adey. As can be seen in Figure 5, the flux of gas facilitated by the openings is non-circular. See col. 7, lines 40-62. As can be clearly seen in the figures, the openings are not louvers and are symmetrical. The ports are preferably evenly spaced with respect to each other (col. 3, lines 18-20). Adey discusses the port size with respect to diameter, implying a circular port opening, which is preferred. However, any shape opening can be used, such as square (straight opening), elliptical (oval or elongated circle), irregular, etc. While some modest adaptation of Adey would be suggested by different port shapes, the same principles apply to such divergent shapes. In general, ports in the cathode cans range in size from anything greater than zero up to about 0.017 inch (greater than 0 to 0.43 mm). See col. 14, lines 8-17. Table 1 discloses that the number of ports may be 1-13 and Figure 2 shows seven openings in the cathode can defining rows.

Regarding claim 14, note the "an aspect ratio of greater than 1" indicates an elongated shape such as a rectangle or an oval. Shapes such as a square or a circle would not have an aspect ratio of greater than 1. Adey teaches an elliptical/oval shape, which is an elongated shape having a curved edge and would inherently have an aspect ratio of greater than 1.

Thus the claims are anticipated.

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Claims 1, 3-5, 11, 12, 51 and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Oltman et al., US 4,591,539.

Oltman teaches a metal-air cathode button cell having grooves constructed between the cathode and cell container (housing) to provide a gas diffusion passage from a port extending through the container to the face of the air cathode. See abstract. Figures 3-5 depict a non-circular flux of gas on the cathode. Figure 5 shows a curvilinear flux of gas. Figure 3 shows an elongated flux of gas. The can may have one or more entry ports (col. 3, lines 15-19). See also col. 3, lines 56-59.

Thus the claims are anticipated.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 8, 12, 13, 15-18, 20, 26 and 30-39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adey et al., US 6,284,400, as evidenced by Linden, Handbook of Batteries.

See discussion of Adey above.

Regarding claims 3, 8, 20 and 26, Adey does not explicitly teach that the opening may be in the shape of a rectangle (elongated straight opening) or that the opening provides a flux of gas in a curvilinear shape.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Adey suggests that the opening may have a rectangular shape. Adey teaches any shape opening can be used, such as square (straight opening), elliptical (oval or elongated circle), irregular, etc. While some modest adaptation of Adey would be suggested by different port shapes, the same principles apply to such divergent shapes. Thus, Adey teaches and suggests modifying the disclosure to provide for openings having different shapes. One of skill would find a rectangular shape obvious in view of the teaching of a square shape by Adey. Furthermore, Adey suggests a curvilinear shape because Adey teaches the opening may have any shape such as irregular.

Regarding claims 15-18, Adey does not explicitly teach the claimed aspect ratios. However, Adey teach at least an opening having an aspect ratio greater than 1. Adey suggests that the port/opening size may be varied depending upon the size of the reaction surface. In general, the smaller the area of the reaction surface to be supported by each port, the smaller the port size can be (col. 13, lines 41-50). The specific number of ports and the specific size of the ports, will of course, depend on the size of the cell (reaction surface) and the performance characteristics demanded of the cell (col. 14, lines 1-4). Adey teaches that it is the total area of the ports that is important. Thus, ports having different aspect ratios would have been obvious to one of ordinary skill because, for example, different sized rectangles can have the same area. One of skill would be motivated to modify Adey because Adey teaches and suggests that the size

of the opening depends upon the size of the cell (reaction surface) and the performance characteristics demanded of the cell.

Regarding claims 12, 13 and 30, Adey does not explicitly teach that the battery is a button cell or a prismatic cell. However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because the skilled artisan would have known that metal-air cells generally have a button or prismatic shape. This is evidenced by Linden, which teaches metal-air cells may have a button or prismatic shape. A prismatic design is shown in Figure 38.2 of Linden. Linden teaches a button cell is used to package a metal-air battery of small size, while a prismatic cell is used to package a metal-air battery of large size (see page 38.7). Thus, the skilled artisan would be motivated to use a button cell or a prismatic cell depending upon the desired size of the cell.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Payne et al., US 6,232,007 discloses a metal-air cell with an opening comprising a louver.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan, who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

January 24, 2003

Patrick Ryan
Supervisory Patent Examiner
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